

WHAT IS CLAIMED:

1. A communication terminal apparatus connected to an analog communication network, the apparatus comprising:

a line interface circuit configured to connect to the analog communication network and to control the network, convert analog data comprising network control and monitor signals and a modulated signal received from the network into digital data, and convert digital data comprising network control and monitor signals and a modulated signal for transmitting to the network into analog data;

a digital signal processing circuit configured to comprise a network control signal processing section that receives network control and monitor signals from the line interface circuit and a modulation and demodulation processing section that receives a modulated digital signal from the line interface circuit and transmits a modulated digital signal to the line interface circuit;

a digital interface device disposed functionally between the line interface circuit and the digital signal processing circuit and configured to electrically isolate the network control and monitor signals and the modulated digital signals; and

a power-saving control device configured to carry out the operation of the line interface circuit and the network control signal processing section of the digital signal processing circuit and suspend the operation of the modulation and demodulation processing section of the digital signal processing

26 circuit so as to be into a power-saving state when a
27 predetermined power-saving state change factor has occurred in a
28 normal operating state, and resume the suspended operation of the
29 modulation and demodulation processing section of the digital
30 signal processing circuit when an incoming call signal is
31 received by the line interface circuit and processed by the
32 network control signal processing section of the digital signal
33 processing circuit during the power-saving state.

1 2. The apparatus according to claim 1, further comprising:

2 a clock signal control device configured to halt and resume
3 supplying an operating clock signal to the modulation and
4 demodulation processing section according to an instruction from
5 the power-saving control device;

6 wherein the power-saving control device generates an
7 instruction to the clock signal control device to halt supplying
8 the operating clock signal to the modulation and demodulation
9 processing section so as to halt an operation thereof when the
10 apparatus changes to the power-saving state, and generates an
11 instruction to the clock signal control device to resume
12 supplying the operating clock signal to the modulation and
13 demodulation processing section so as to resume operation thereof
14 when the apparatus returns to the normal operating state.

1 3. The apparatus according to claim 1, further comprising:

2 a dedicated signal line configured to transmit a

return-to-the normal operating state request signal from the network control signal processing section to the power-saving control device.

4. The apparatus according to claim 1, further comprising:

a common signal line configured to transmit an interrupt request signal from the modulation and demodulation processing section during the normal operating state, and transmit a return-to-the normal operating state request signal from the network control signal processing section during the power-saving state.

5. The apparatus according to claim 1, further comprising:

a serial communication line configured to be used for a signal transmission from the modulation and demodulation processing section during the normal operating state, and used for a transmission of a return-to-the normal operating state request signal from the network control signal processing section during the power-saving state.

6. A communication terminal apparatus connected to an analog communication network, the apparatus comprising:

line interface means for connecting to the analog communication network, controlling the network, converting analog data comprising network control and monitor signals and a modulated signal received from the network into digital data, and

7 converting digital data comprising network control and monitor
8 signals and a modulated signal for transmitting to the network
9 into analog data;

10 digital signal processing means comprising a network control
11 signal processing section that receives network control and
12 monitor signals from the line interface means and a modulation
13 and demodulation processing section that receives a modulated
14 digital signal from the line interface means and transmits a
15 modulated digital signal to the line interface means;

16 isolating means disposed functionally between the line
17 interface means and the digital signal processing means, for
18 electrically isolating the network control and monitor signals
19 and the modulated digital signals; and

20 means for carrying out the operation of the line interface
21 means and the network control signal processing section of the
22 digital signal processing means and suspending the operation of
23 the modulation and demodulation processing section of the digital
24 signal processing means so as to be into a power-saving state
25 when a predetermined power-saving state change factor has
26 occurred in a normal operating state, and resuming the suspended
27 operation of the modulation and demodulation processing section
28 of the digital signal processing means when an incoming call
29 signal is received by the line interface means and processed by
30 the network control signal processing section of the digital
31 signal processing means during the power-saving state.

1 7. A method for controlling a communication terminal apparatus
2 connected to an analog communication network, the method
3 comprising:

4 waiting for an incoming call from the analog communication
5 network for a predetermined period;

6 carrying out an operation of network control signal
7 processing and suspending an operation of modulation and
8 demodulation processing when the predetermined period has passed
9 without the communication terminal apparatus being in operation;

10 resuming the suspended operation of modulation and
11 demodulation processing when an incoming call from the analog
12 communication network arrives at the communication terminal
13 apparatus;

14 receiving a modulated analog signal from the analog network;
15 converting the received modulated analog signal into a
16 received modulated digital signal;

17 electrically isolating the received modulated digital signal
18 in a digital signal region;

19 demodulating the isolated received modulated digital signal
20 into demodulated digital data.

1 8. A method of controlling a communication terminal connected
2 to an analog communication network comprising:

3 providing as a part of the communication terminal a digital

4 processor having a subsystem that, when in an active

5 state, demodulates information received from the analog

6 communication network and modulates information for
7 transmission to the analog network system;
8 selectively providing a first control signal indicative of a
9 desired change of the communication processor from a
10 normal state to a waiting state and, in response
11 thereto, changing said digital processor subsystem from
12 an active state in which it demodulates information
13 received from the analog communication network and
14 modulates information for transmission to the analog
15 communication network to a suspended state in which it
16 consumes less power than in the active state;
17 selectively providing a second control signal indicative of
18 a desired change of the communication terminal back to
19 its normal state and, in response thereto, changing
20 said digital processor subsystem back to its active
21 state for receiving and demodulating information from
22 the analog communication network and for modulating and
23 sending information to the analog communication
24 network;
25 thereby saving power by selectively suspending the operation
26 of said digital processor subsystem while retaining an
27 ability to change back to an active state thereof when
28 needed to receive and demodulate information from and
29 to modulate and send information to the analog
30 communication network.

002260-2249960

1 9. A method as in claim 8 in which said digital processor is
2 driven by clock signals and said changing the digital
3 processor subsystem to its suspended state comprises
4 substantially reducing a rate of said clock signals.

1 10. A method as in claim 8 in which said changing the digital
2 processor subsystem to its suspended state comprises
3 substantially reducing an amount of power supplied to said
4 subsystem.

1 11. A method as in claim 8 in which said communication terminal
2 further comprises a central processing unit (CPU) having an
3 interrupt request input terminal coupled with said digital
4 processor and to said analog communication network, said CPU
5 responding to an interrupt request on said input terminal
6 when the communication terminal is in its waiting state by
7 providing information initiating said second control signal,
8 but responding to an interrupt request on said input
9 terminal by providing services to said subsystem when the
10 communication terminal is in its normal state.

1 12. A communication terminal connected to an analog
2 communication network and comprising:
3 a digital signal processor having configured to include a
4 subsystem that, when in an active state, demodulates
5 information received from the analog communication

6 network and modulates information for transmission to
7 the analog network system;
8 a source of a first control signal indicative of a desired
9 change of the communication processor from a normal
10 state to a waiting state;
11 a first control circuit coupled to said source of the first
12 control signal and said digital signal processor
13 subsystem and configured to respond to the first
14 control signal by changing said digital signal
15 processor subsystem from an active state in which it
16 demodulates information received from the analog
17 communication network and modulates information for
18 transmission to the analog communication network to a
19 suspended state in which it consumes less power than in
20 the active state;
21 a source of a second control signal indicative of a desired
22 change of the communication terminal back to its normal
23 state;
24 a second control circuit coupled with said source of the
25 second control signal and said digital signal processor
26 subsystem and configured to respond to the second
27 control signal by changing said digital signal
28 processor subsystem back to its active state for
29 receiving and demodulating information from the analog
30 communication network and for modulating and sending
31 information to the analog communication network;

32 thereby saving power by selectively suspending the operation
33 of said digital signal processor subsystem while
34 retaining an ability to change back to an active state
35 thereof when needed to receive and demodulate
36 information from and to modulate and send information
37 to the analog communication network.

1 13. A communication terminal as in claim 12 including a source
2 of clock signal coupled with said digital signal processor
3 to drive the processor and with said first and second
4 control circuits and responding to said control circuits to
5 supply clock signals at a high rate during said active state
6 and at a low rate during said suspended state.

1 14. A communication terminal as in claim 12 including a circuit
2 configured to supply operating power to said digital signal
3 processor subsystem and with said first and second control
4 circuits and responding to said control circuits to supply
5 higher operating power during said active state and low
6 operating power during said suspended state.

1 15. A communication terminal as in claim 12 in which said
2 communication terminal further comprises a central
3 processing unit (CPU) having an interrupt request input
4 terminal coupled with said second control circuit and with
5 said analog communication network, said CPU responding to an

6 interrupt request on said input terminal when the
7 communication terminal is in its waiting state by providing
8 information initiating said second control signal, but
9 responding to an interrupt request on said input terminal by
10 providing services to said subsystem when the communication
11 terminal is in its normal state.

[illegible]